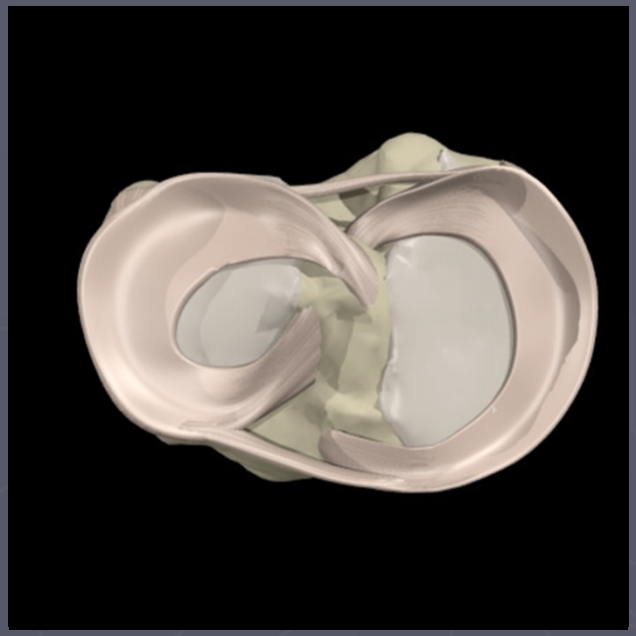
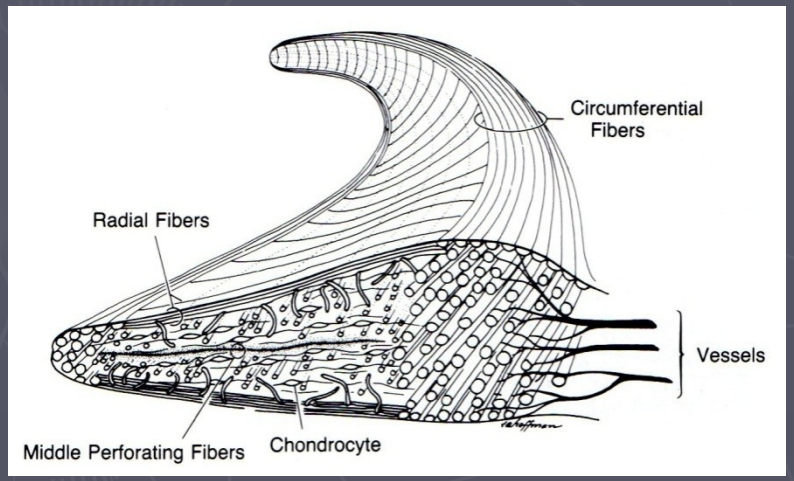
MENISCAL TEARS

MENISCAL TEARS

MENISCOS

- Fibrocarilage
- Semilunar
- Internal: C
- External: O





MENISCI

- Parallel colagen fibers
  - ✓Radial (sup/inf)
  - ✓Circunferencial
  - ✓Perforans

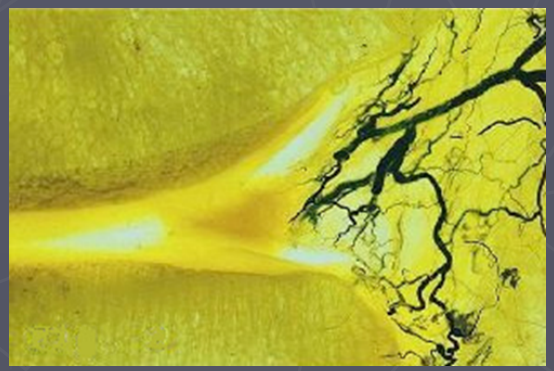
AMOCZEKY (1983) describes vascular pattern. Allows healing perspective.

DEHAVEN, HENNING e IKEUCHI pioneers in meniscal reparation

MINTZER (1998) publishes is results on meniscal sutures on 26 young sportmen from which 24 returned to sport at the same performance level.

VASCULAR AREAS

- **Red-Red**
- **Red-White**
- **White-White**



AMOCZEKY SP, WARREN RF: Microvasculature of the meniscus and its response to injury. An experimental study in the dog: Am J Sports Med 1983; 11(3): 131-41.

HENNING CE. Arthroscopic repair of meniscus tear. Orthopedics 1983; 6: 1130-32.

MENISCAL TEARS

FUNCTION

- Articular congruence
- Articular stability
- Flex-ext control
- Lubrication
- Nourishment
- Shock absorption
- Load transmission
- Stress

MENISCAL TEARS

INJURY MECHANISM

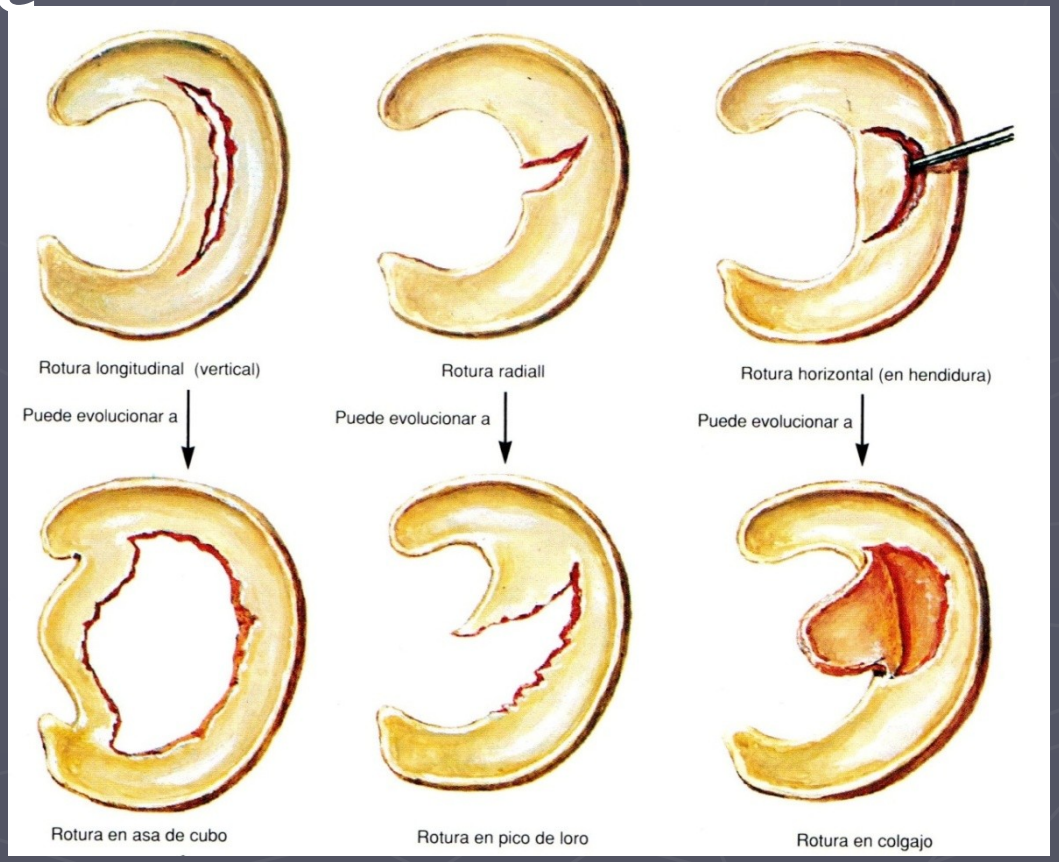
- Flexion / Compression / Rotation

- DIRECT
- INDIRECT

MENISCAL TEARS

TYPE OF MENISCAL TEAR

- Longitudinal
- Bucket handle
- Horizontal
- Oblique
- Radial
- Flap
- Complex



MENISCAL TEARS

DX

- HISTORY
- EXPLORATION
  - Grinding Tests
    - McMurray
    - Apley
    - Steinmann I y II
  - Compression Tests
    - Extension
    - Abd/Add
    - Spring

MENISCAL TEARS

THERAPEUTICAL CHOICES

- HANDS OFF
- Meniscectomy
- Meniscotomy
  - ✓Strategy
  - ✓Meniscal saving
- Meniscal Suture
  - ✓Inside out
  - ✓Outside in
  - ✓All inside
- Meniscal Transplantation
  - ✓allograft
  - ✓synthetico

MENISCAL TEARS

THERAPEUTICAL CHOICES

- **HANDS OFF**
- Meniscectomy
- Meniscotomy
  - ✓Strategy
  - ✓Meniscal saving
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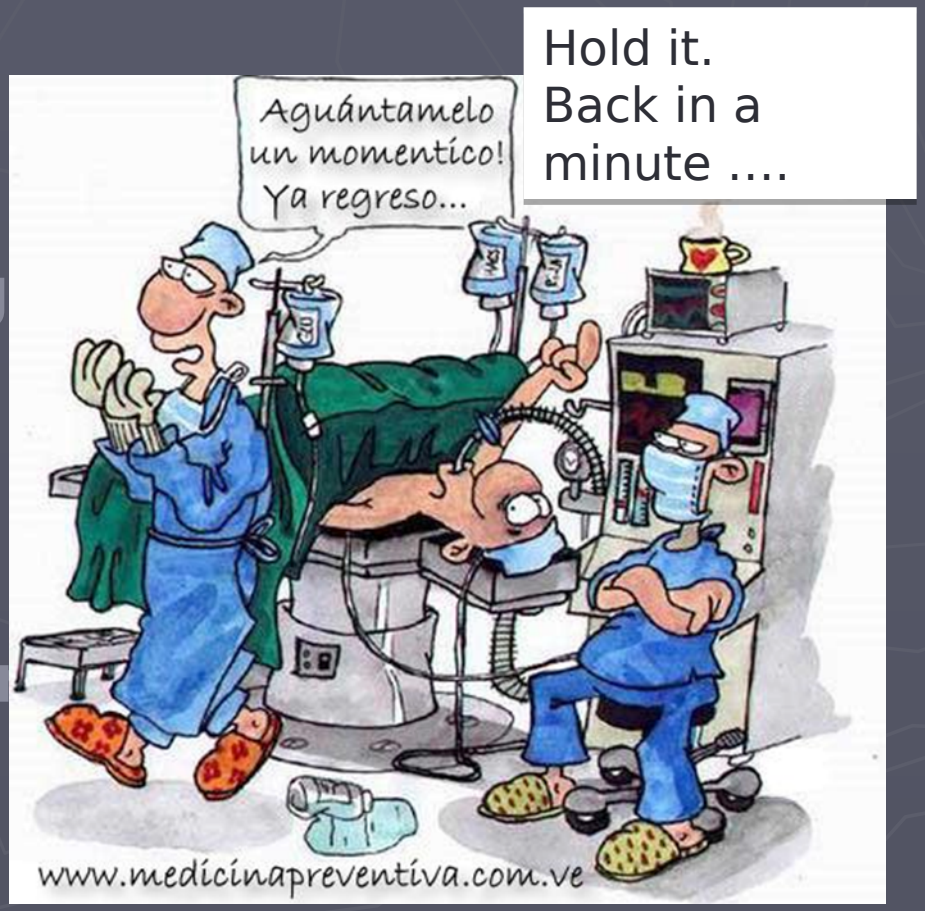


MENISCAL TEARS

THERAPEUTICAL CHOICES

- **HANDS OFF**
- Meniscectomy
- Meniscotomy

- **ASIMPTOMATIC**
- **Mild simptoms**

- **Partial thickness**
- **Short Radial ≤ 3mm**
- **Vertical-longitudinal in meniscocapsular junction**
- **Total Thickness ≤ 10mm**

ng

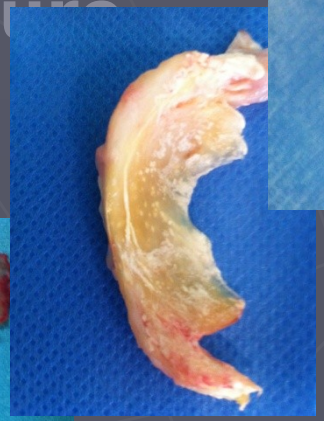
ant

- ✓ allograft
- ✓ synthetico

MENISCAL TEARS

THERAPEUTICAL CHOICES

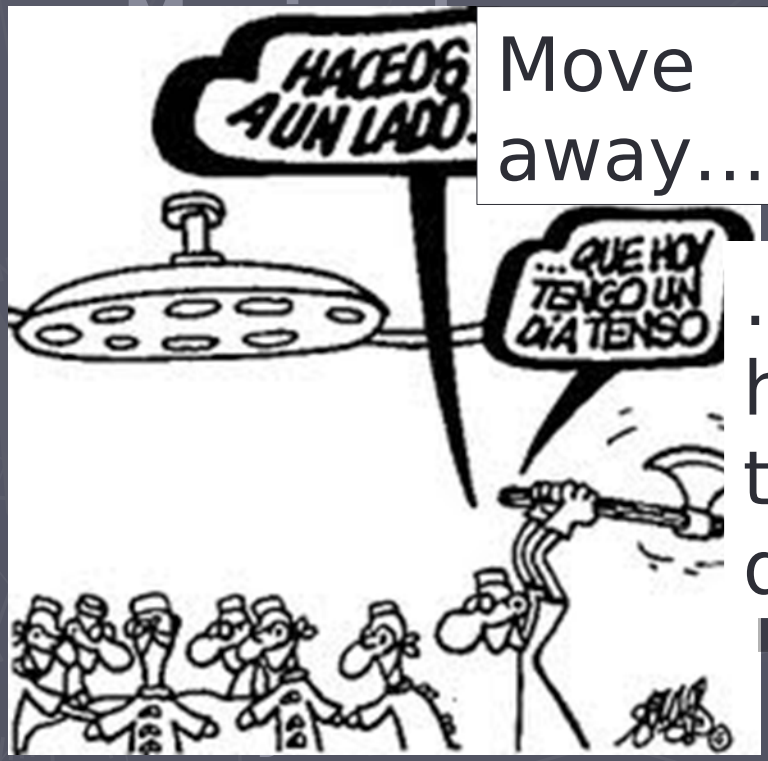
- HANDS OFF
- **Meniscectomy**
- Meniscotomy
  - ✓Strategy
  - ✓Meniscal saving
- Meniscal Sutu
  - ✓Inside out
  - ✓Outside in
  - ✓All i
- Menisc
  - ✓allog
  - ✓synt



MENISCAL TEARS

THERAPEUTICAL CHOICES

- HANDS OFF
- **Meniscectomy**
  - **Non reduced Bucket handle**
  - **Degenerative tears**
    - ✓**Large**
    - ✓**Instable**



Move away…

… I’m having a tough day

MENISCAL TEARS

THERAPEUTICAL CHOICES

- HANDS OFF
- Meniscectomy
- **Meniscotomy**
  - ✓Strategy
  - ✓Meniscal saving
- Meniscal Suture
  - ✓Inside out
  - ✓Outside in
  - ✓All inside
- Meniscal Transplantation
  - ✓allograft
  - ✓synthetico

MENISCAL TEARS

THERAPEUTICAL CHOICES

- HANDS OFF
- Meniscectomy
- **Meniscotomy**
  - ✓**Strategy**
  - ✓Meniscal saving
- Meniscal Suture
-
  - ✓synthetic

- **Type**
- **Location**
- **Size**
- **Age**
- **Stability**

MENISCAL TEARS

THERAPEUTICAL CHOICES

- HANDS OFF
- Meniscectomía
- **Meniscotomía**
  - ✓**Strategy**
  - ✓**Meniscal saving**

- Type
- Location
- Stability
- Age
- Stability

- Small tears
- Horizontal tears
- Marginal tears
- Degenerativas tears
- Instable tears

MENISCAL TEARS

THERAPEUTICAL CHOICES

- **Meniscal suture**
  - ✓ Inside out
  - ✓ Outside in
  - ✓ All inside
- **Meniscal Transplantation**
  - ✓ Allograft
  - ✓ synthetic

LOCATION

- Capsulomeniscal junction
- Red-Red area
- Red-White area
- White-white area

ETHIOLOGY

- Acute
- Degenerative

STABILITY

MENISCAL TEARS

THERAPEUTICAL CHOICES

- Meniscal suture
  - ✓Inside out
  - ✓Outside in
  - ✓All inside
- Meniscal transplantation
  - ✓Allograft
  - ✓synthetic

ANATOMICAL

- > 1cm
- Instable
- Linear tear
- Red-red area
- Red-white area
- No laxities
- No axial deviations

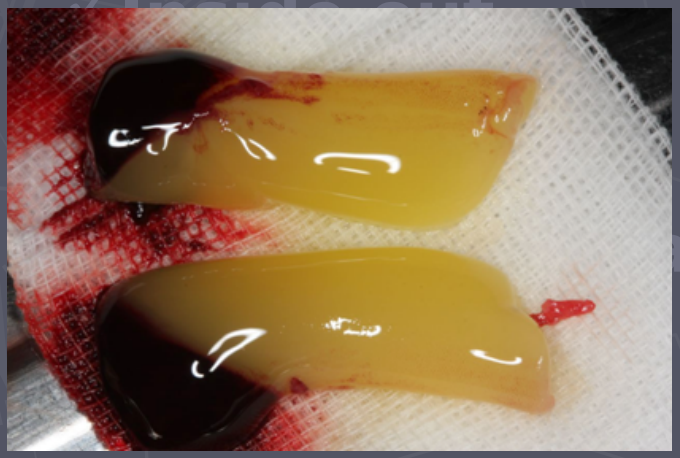
GENERAL

- Aged
- Health status
- Tissue quality
- Patient attitude

MENISCAL TEARS

THERAPEUTICAL CHOICES

- HANDS OFF
- Meniscectomía
- Meniscotomía
  - ✓Estrategia
  - ✓Economía meniscal
- **Meniscal suture**
  - ✓Inside-out
  - ✓Outside-in
  - ✓All-inside
- Implantation



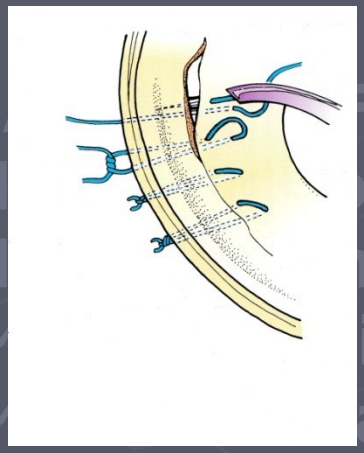
ADDITIONAL ACTIONS

- **Curettage**
- **Surface Regularization**
- **Meniscus Trephining**

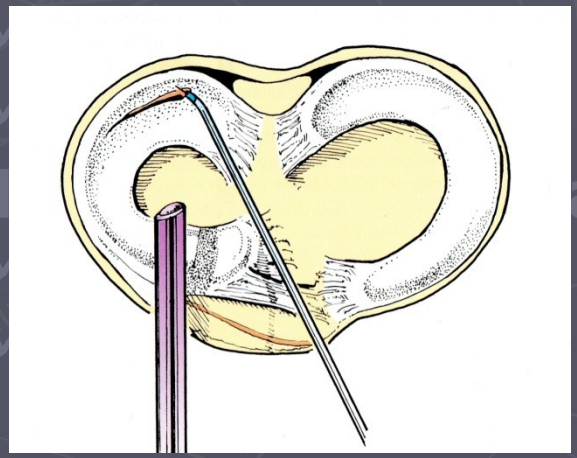
- **Fibrine clot**
- **PRP**

MENISCAL TEARS

THERAPEUTICAL CHOICES



- **Meniscal suture**
  - ✓**Inside out**



PROS

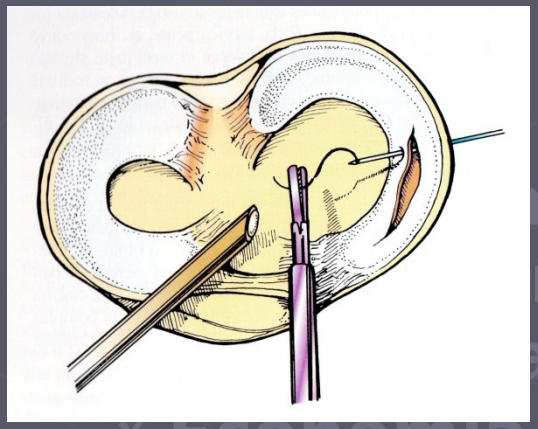
- **2 point fixation**
- **Better fixation in instable tears**

CONS

- **Neurovascular Injuries**
- **Suture failure (knot)**
  - ✓**Vertical**
  - ✓**Horizontal**

MENISCAL TEARS

THERAPEUTICAL CHOICES



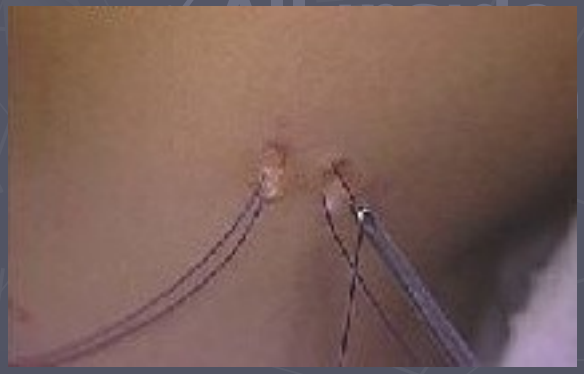
PROS

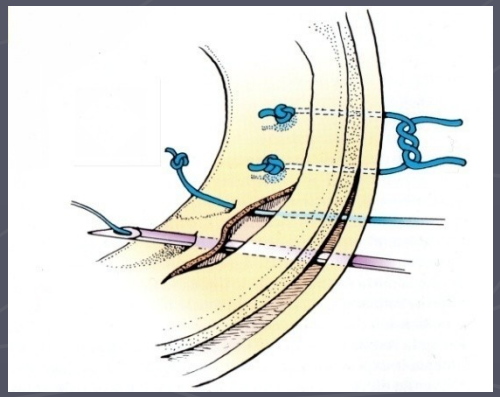
- **Posterior horn tear (best choice)**

CONS

- **Reduction problems (needle angulation)**

- **Meniscal suture**
  - ✓ **Inside out**
  - ✓ **Outside in**





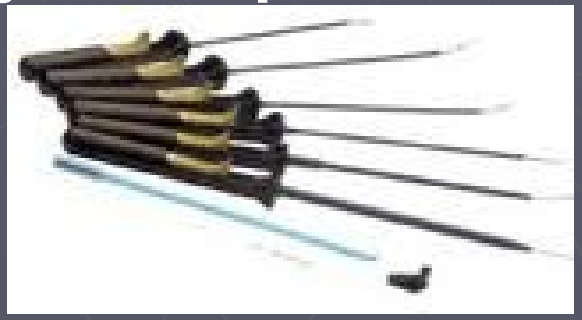
MENISCAL TEARS

THERAPEUTICAL CHOICES

- **Meniscal suture**
  - ✓Inside out
  - ✓Outside in
  - ✓**All inside**
- **Meniscal transplantation**
  - ✓Allograft
  - ✓synthetic

PROS

- **Easy technique**



CONS

- **Neurovascular injury**
- **Mechanical irritation**
- **Cysts**
- **Chondral injuries**
- **Rupture / Migration**

MENISCAL TEARS

THERAPEUTICAL CHOICES

- HANDS OFF
- Meniscectomía
- Meniscotomía
  - ✓Estrategia
  - ✓Economía menisc
- Meniscal suture
  - ✓Inside out
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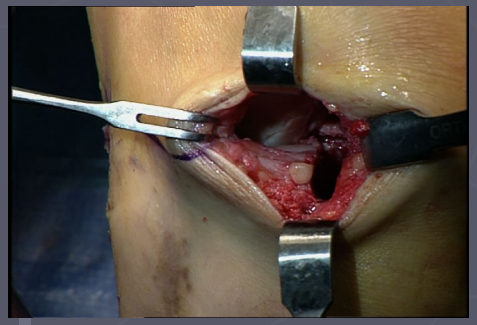
MENISCAL TEARS

THERAPEUTICAL CHOICES



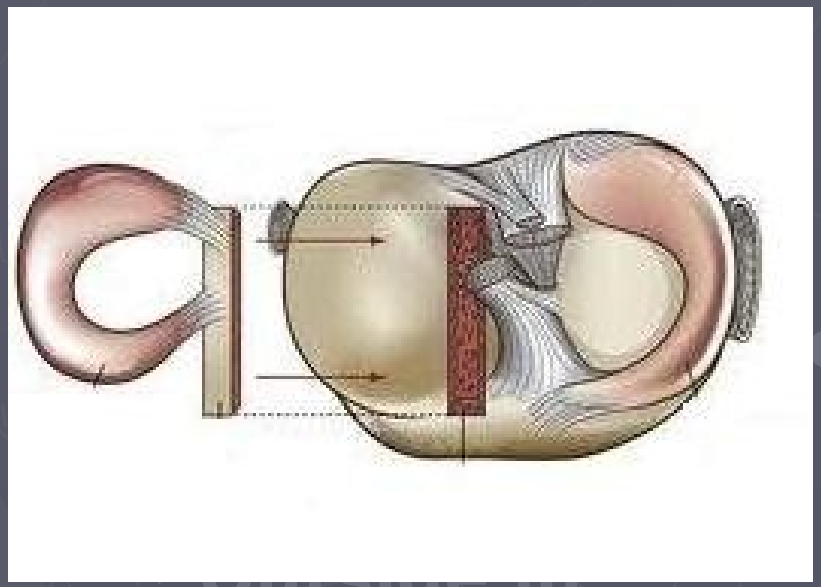
- HANDS OFF
- Meniscectomía
- Meniscotomía
  - ✓Estrategia
  - ✓Economía meniscal
- Meniscal suture
  - ✓Inside out
  - ✓Outside in
  - ✓All inside
- **Meniscal transplantation**
  - ✓Allograft
  - ✓synthetic

GENERAL CONSIDERATIONS

- **Feaseble**
- **Very demanding**

MENISCAL TEARS

THERAPEUTICAL CHOICES



INDICATIONS

- **Young**
- **Previous meniscectomy**
- **X-Ray changes (Fairbank)**
- **Chondral injuries < type II**
- **Normal alignment**
- **Stable**
- **Symptoms ???**

- **Meniscal transplantation**
  - ✓ **All inside**
  - ✓ **Allograft**
  - ✓ **synthetic**

MENISCAL TEARS

THERAPEUTICAL CHOICES

- **Meniscal transplantation**
  - ✓ **Allograft**
  - ✓ synthetic

YET TO SEE

- Harvesting
- Sterility / Sterilization
- Storage
- Inmunology
- Size of implant
- Fixation
  - Soft sutures
  - Plugs
  - Groove
  - Bridge
  - Keyhole
- Healing
- Regeneration

MENISCAL TEARS

THERAPEUTICAL CHOICES

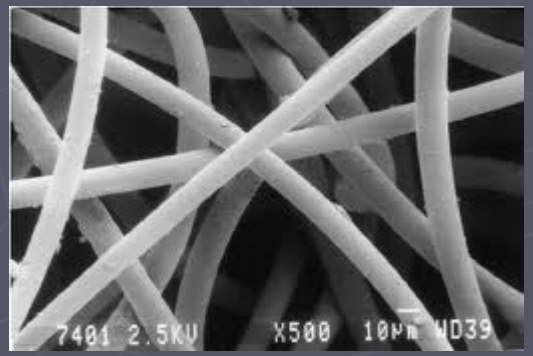
- **No** good results
- **No** normal histology
- Advances in tissue engineering
- Yet to know life span

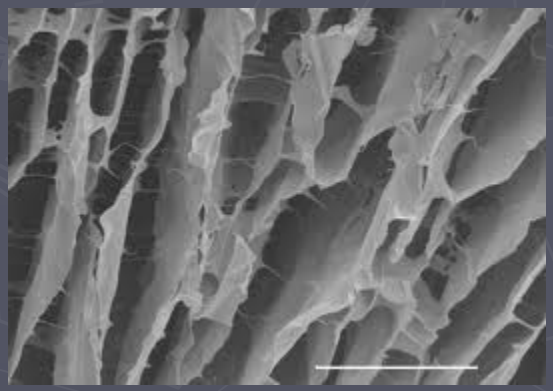
Types

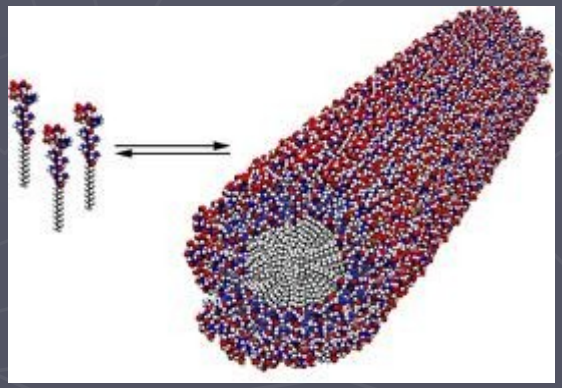
- COLAGEN
- PERMANENT MATRIX
- BIOABSORBABLE MATRIX

- **Meniscal transplantation**
  - ✓ **Allograft**
  - ✓ **synthetic**

Where do we go???







FUTURE

SUTURE TRASPLANTION

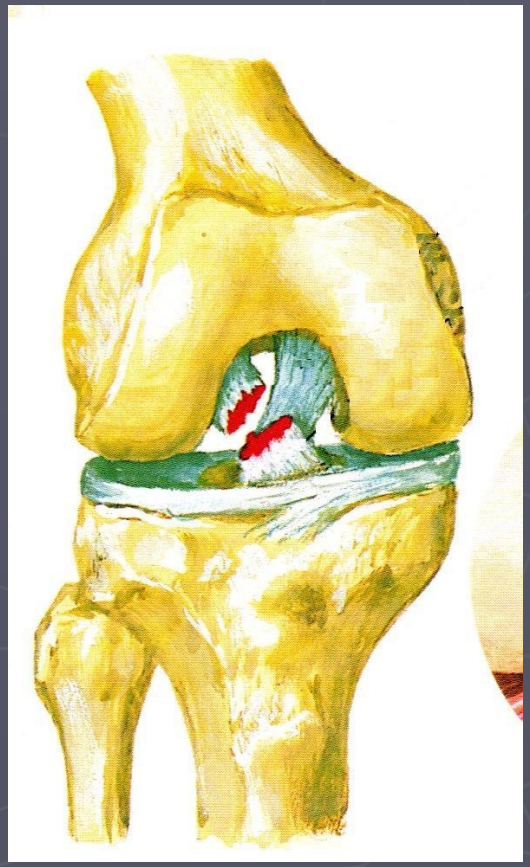
- Improve materials
- Facilitate technique
- Tissue engineering
  - Meniscal tissue
  - Celular culture
  - Coadyuvants
  - Adhesives

ENJOY
YOUR NEW
MENISCUS
HANNA

LIGAMENT INJURIES

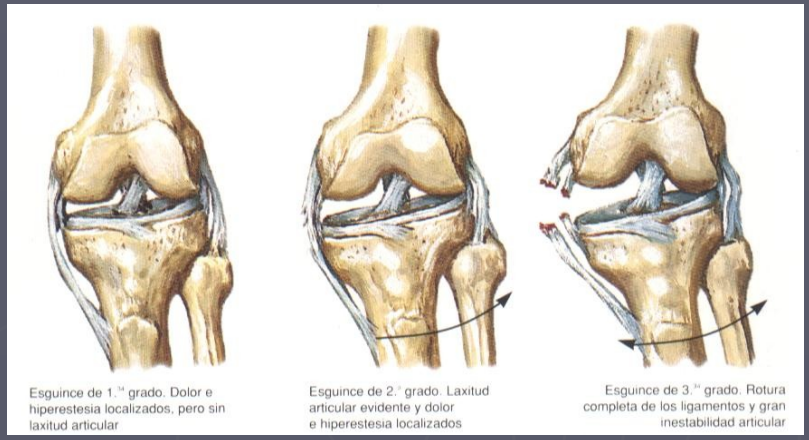
- Mechanism
  - Direct
  - Indirect
- Classification
- Dx
- Imaging
- Treatment

LIGAMENT INJURIES



LIGAMENT INJURIES
- Mechanism
  - Direct
  - Indirect
- Classification
- Dx
- Imaging
- Treatment

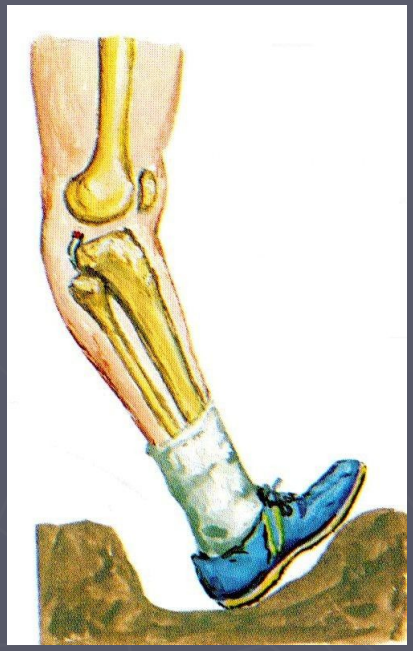
MECHANISM


Esguince de 1.er grado. Dolor e hiperestesia localizados, pero sin laxitud articular
Esguince de 2.º grado. Laxitud articular evidente y dolor e hiperestesia localizados
Esguince de 3.er grado. Rotura completa de los ligamentos y gran inestabilidad articular

- **DIRECT**: Most frequent
  - **Varus: Scarce**
    - Tibia locked to the ground
    - Internal force ⟹ Varus/Ext.Rot/Add
  - **LOW ENERGY**
    - Lateral colateral sprain
  - **HIGH ENERGY**
    - Lateral collateral rupture
    - ACL total rupture
    - Popliteous tendon Rupture
    - PLC Rupture
    - PCL Rupture
    - Elongation/Rupture Popliteous nerve

LIGAMENT INJURIES
- Mechanism
  - Direct
  - Indirect
- Classification
- Dx
- Imaging
- Treatment

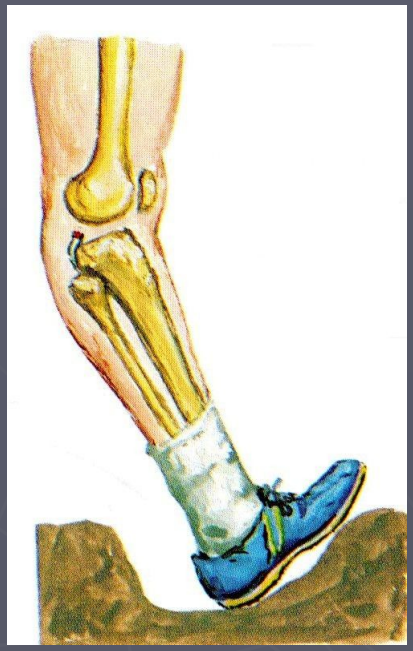
MECHANISM



- **DIRECT**: Most frequent
  - **Hiperextension: Scarce**
    - Tibia locked to the ground
    - Anterior force ⟹ Recurvatum
  - **LOW ENERGY**
    - Posterior capsule elongationa
  - **HIGH ENERGY**
    - Anterior capsule rupture
    - ACL rupture
    - PCL Rupture

LIGAMENT INJURIES
- Mechanism
  - Direct
  - Indirect
- Classification
- Dx
- Imaging
- Treatment

MECHANISM



- **DIRECT**: Most frequent
  - **AP**
    - Knee Flexed
    - Tibia locked to the ground
  - **ENERGY APPLIED ON FEMUR**
    - ACL rupture
  - **ENERGY APPLIED ON TIBIA**
    - PCL Rupture

LIGAMENT INJURIES
- Mechanism
  - Direct
  - Indirect
- Classification
- Dx
- Imaging
- Treatment

MECHANISM

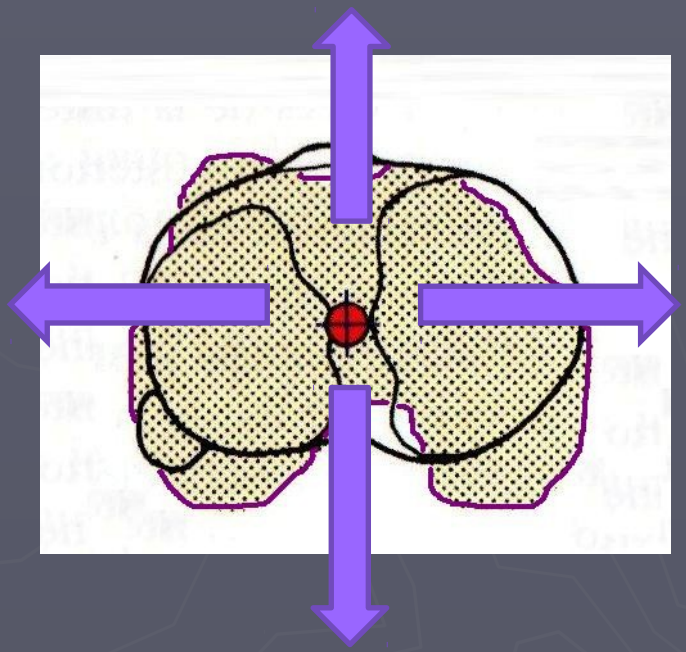
INDIRECT:

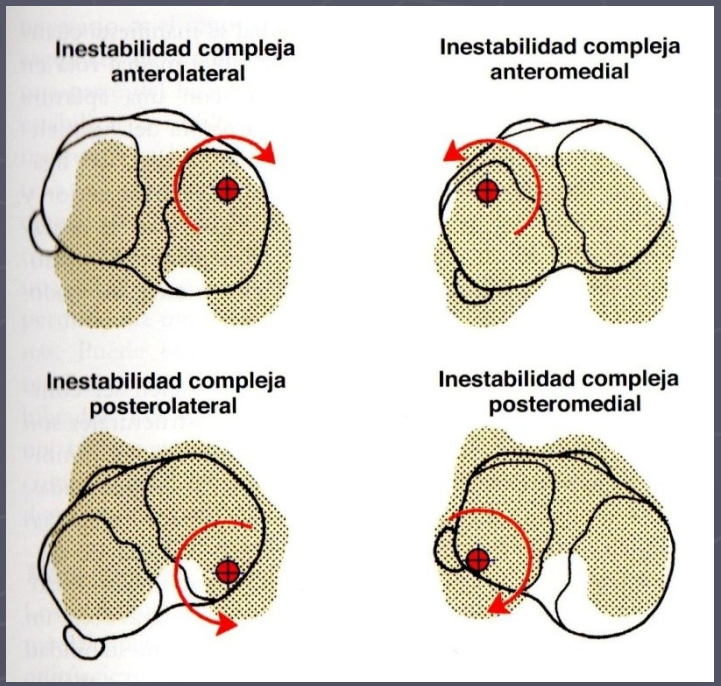
- Same than DIRECT MECHANISM
- NO CONTACT

LIGAMENT INJURIES
- Mechanism
  - Direct
  - Indirect
- Classification
- Dx
- Imaging
- Treatment

CLASSIFICATION

- **ONE AXIS**
  - Anterior
  - Posterior
  - Medial
  - Lateral
- **ROTATIONAL**
  - Anteromedial
  - Anterolateral
    - Flex
    - Ext
  - Posterolateral
  - Posteromedial
- **COMBINED**
  - AL-AM
  - AL-PL
  - AM-PM



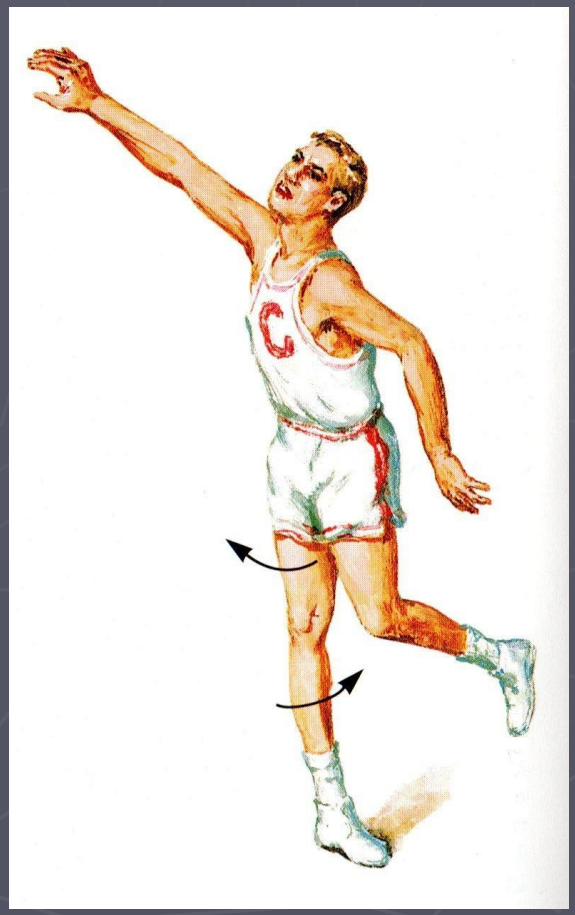


LIGAMENT INJURIES
- Mechanism
  - Direct
  - Indirect
- Classification
- Dx
- Imaging
- Treatment

DX

HISTORY

- INJURY MECHANISM
- INITIAL SIGNS
- REMISSION?
- ACTUAL SYMPTOMS

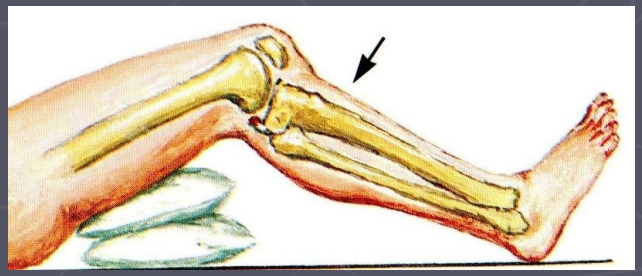


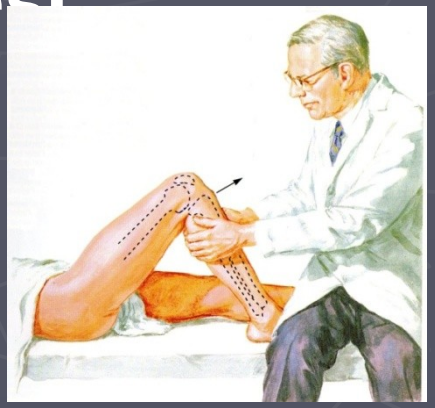
LIGAMENT INJURIES
- Mechanism
  - Direct
  - Indirect
- Classification
- Dx
- Imaging
- Treatment

DX

EXPLORATION

- **STANDARD STRESS TESTS**
  - Varus Stress 0/30
  - Valgus Stress 0/30
  - Anterior Drawer N, IR, ER
  - Lachmann 0/15
  - Posterior Drawer
  - Active Quadriceps test





DX

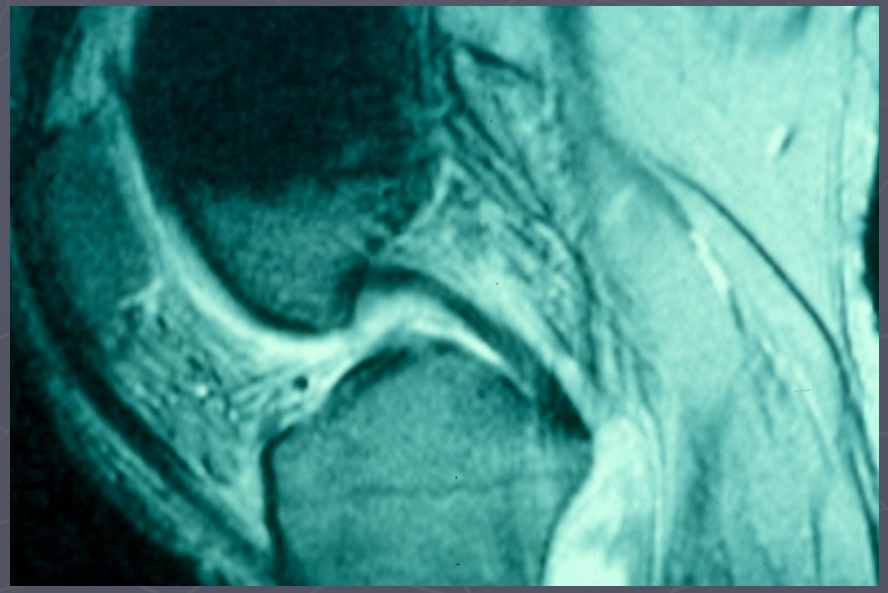
EXPLORATION

- **ROTATIONAL TESTS**
- Rotational Anterior Drawer (Slocum)
  - Jerk Test
  - Mac Intosh
  - Pivot Shift

LIGAMENT INJURIES
- Mechanism
  - Direct
  - Indirect
- Classification
- Dx
- Imaging
- Treatment

IMAGING

- X-ray
- Stress X-ray
- MRI



LIGAMENT INJURIES
- Mechanism
  - Direct
  - Indirect
- Classification
- Dx
- Imaging
- Treatment
  - Conservative

TREATMENT

CONSERVATIVE:

- Partial Ruptures (Stages I and II)
- No laxity
  - Cast
  - Orthesis
  - Rehab
- MCL total ruptures

LIGAMENT INJURIES

- Mechanism
  - Direct
  - Indirect
- Classification
- Dx
- Imaging
- Treatment
  - Conservative
  - Surgical

TREATMENT

SURGICAL:

- LCL
- ACL
- PCL
- PLC